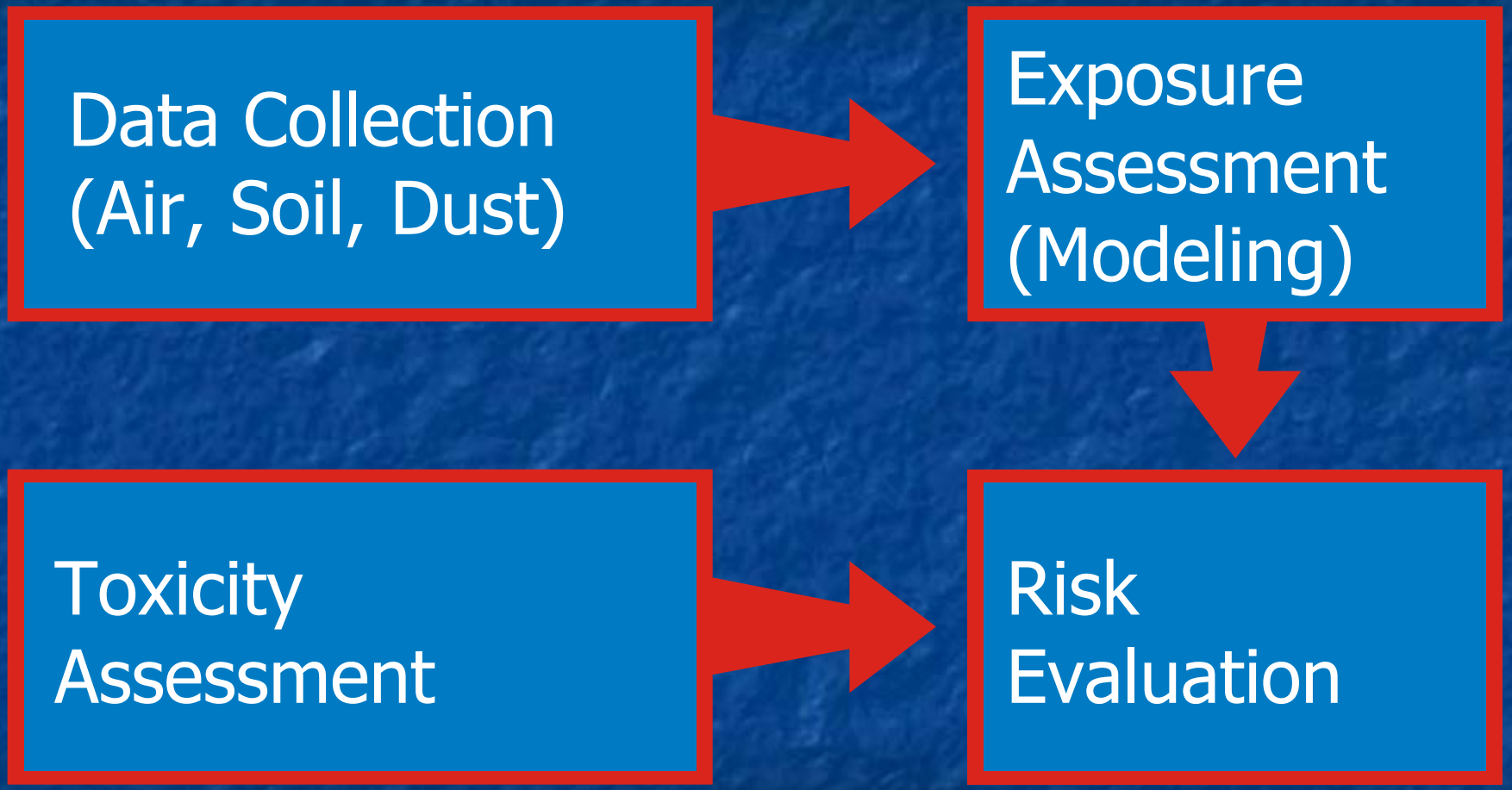
North Ridge Estates

EPA's Risk Assessment Paradigm

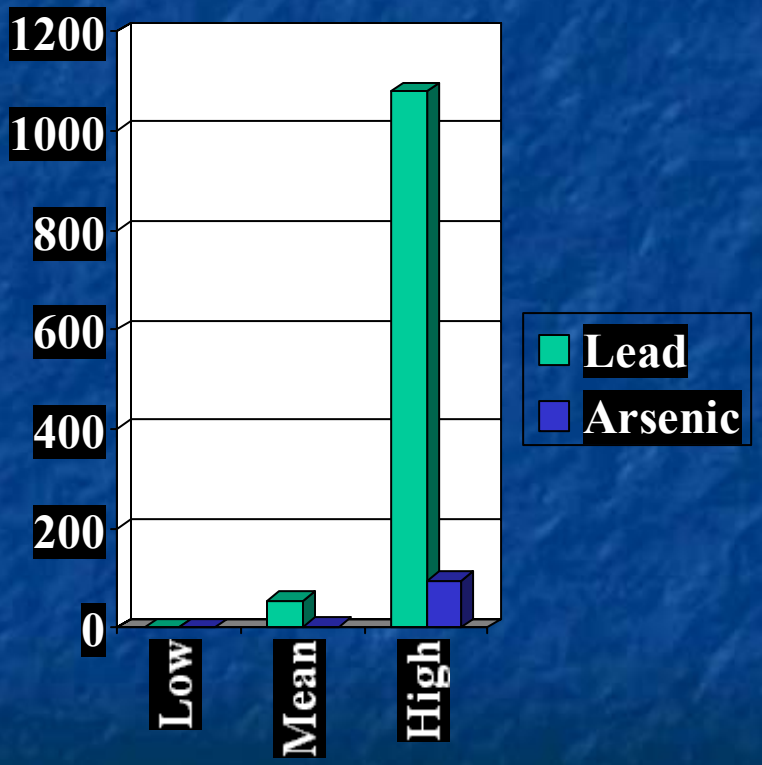


What Data Is Being Collected?

- Air Data Inside and Outside of Homes (to determine if fibers are present in ambient air)
- Soil Data Area-Wide and in Each Yard (to determine the extent to which fibers have been released to soil)
- Dust

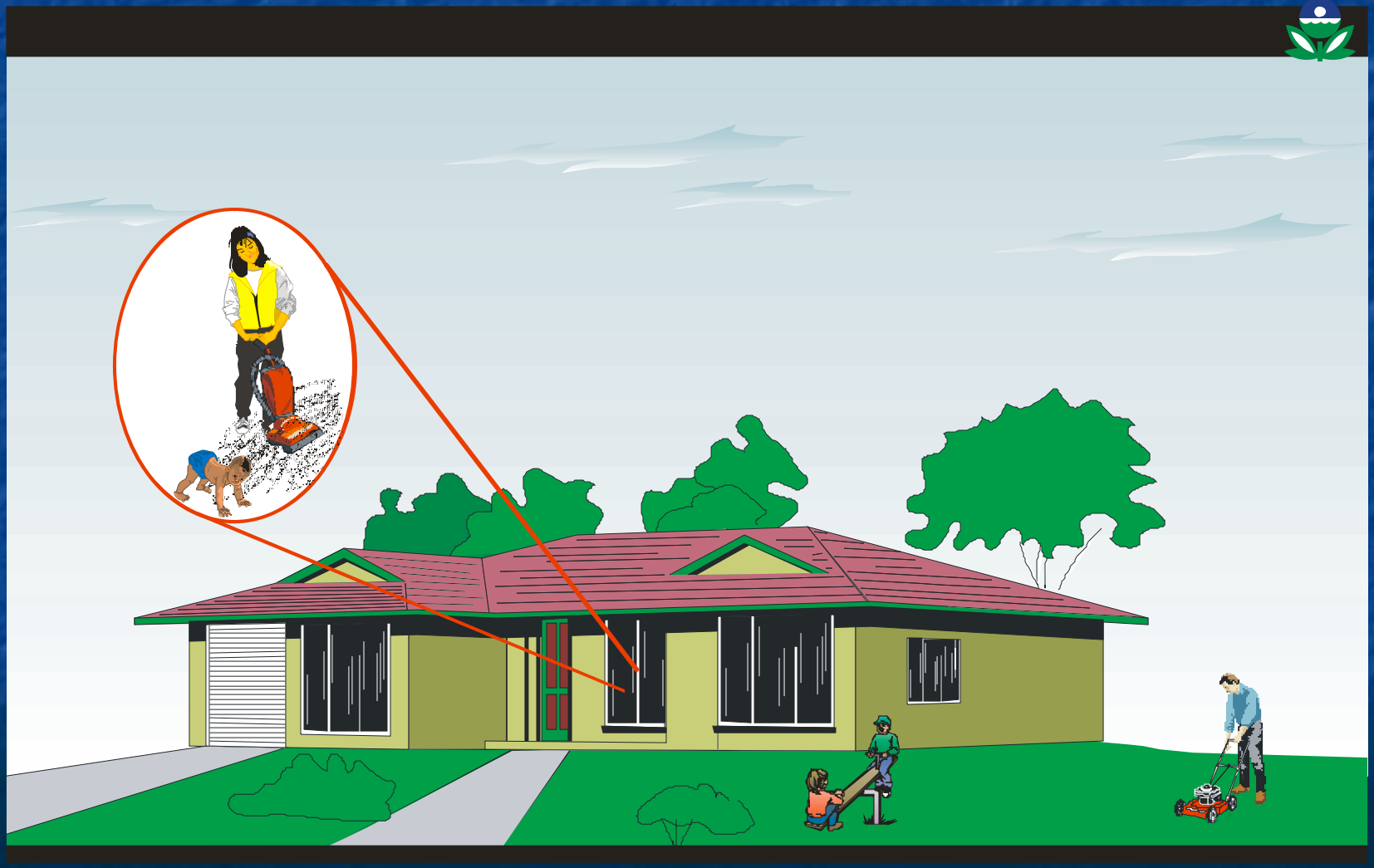
ACTIVITIES BY EXPOSURE PATHWAY

OTHER CONTAMINANTS Results



- 168 samples were analyzed for lead and arsenic using XRF
- Lead: 82 detects (2 locations > 400 ppm)
- Arsenic 5 detects (two locations > 20 ppm, but less than 100 ppm)

Conceptual Site Model



Toxicity Evaluation of Asbestos

- Our knowledge about asbestos is changing
- There are two main types of fibers:
  - Chrysotile - serpentine
  - Amphiboles - amosite, tremolite, actinolite, crocidolite, anthophyllite
- Fiber length may be critical in determining potency

SITE BACKGROUND
Mineral Forms of Asbestos*

- Concrete Asbestos Board (CAB): 25% asbestos (mostly chrysotile)
- Vinyl Floor Tiles (VAT): 6-7% asbestos
- Roofing Material: 30% asbestos (chrysotile and amosite)
- Steam Pipe Insulation: 45% asbestos (amosite and chrysotile)

* Based on earlier studies conducted by ODEQ

Risk Characterization

Exposure X Toxicity = Risk

Conc X IR X ED X EF X SF = ELCR

Where:

Conc = Concentration of fibers in air
IR = Inhalation Rate
ED = Exposure Duration (years)
EF = Exposure Frequency (days/year) or (hours/day)
SF = Cancer potency factor
ELCR = Excess Lifetime Cancer Risk

Cancer Risk Benchmarks

CERCLA (EPA): Point of departure if action is needed	MTCA (Ecology): Total risk goal	CERCLA (EPA): Action generally warranted			Background for women (1/3) Background for men (1/2)	
1E-6	1E-5	1E-4	1E-3	1E-2	1E-1	1E0
0.0001%	0.001%	0.01%	0.1%	1%	10%	100%

Why EPA Sets Cautious Limits	Some Causes for Background
Uncertainty	Smoking
No personal control	Diet
Involuntary Risks	Natural radiation
	Occupational exposures

Note: Oregon DEQ's proposed regulations suggest 1E-6 as the goal for individual facilities.